

**ABSTRACT**

A method of using a magnetic fluid clutch for torque measurement comprises steps of modulating electric current through a coil of the magnetic fluid clutch to  
5 maintain a steady-state quasi-solid phase of a magnetic fluid medium contained within the magnetic fluid clutch when the magnetic fluid clutch is clutched to transmit torque from a torque input end of the clutch to a torque output end of the clutch, thereby ensuring that the torque output end rotates  
10 in response to the rotation of the torque input end without relative rotational slippage therebetween; and measuring a deflection value associated with the magnetic fluid clutch. The clutch is thereby used as a combined torque measurement and clutch apparatus.